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10/765,647	01/26/2004	Laura Wills Mirkarimi	10030753-1	1183

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EXAMINER

DEO, DUY VU NGUYEN

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1765

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/765,647
Filing Date: January 26, 2004
Appellant(s): MIRKARIMI, LAURA WILLS

J Krause-Polstorff
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/14/06 and 9/28/06 (applicant's response to the non-compliant appeal brief) appealing from the Office action mailed 3/14/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,338,394

Fathimulla et al.

8-1994

Pearson et al., "High-rate, anisotropic dry etching of InP in HI-based discharges", Appl. Phys. Lett, 60(7), (Feb. 17, 1992), pg 838-840

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fathimulla et al. (US 5,338,394) and Pearton et al. (Appl. Phys. Lett. 60 (7)).

Fathimulla describes a method for etching an III-V material comprising: placing the III-V substrate into a RIE chamber and etching the substrate with a gas mixture of HBr and CH₄ (claims 1-4). Unlike claimed invention, Fathimulla doesn't describe the gas mixture having H₂. Pearton teaches a method for etching III-V material wherein the gas mixture includes H₂ (pages 839; left column). It would have been obvious for one skilled in the art at the time of the invention to modify Fathimulla in light of Pearton by including H₂ in the gas mixture because Pearton teaches addition of the H₂ to the gas mixture provide a much smoother surfaces and Fathimulla teaches that other combinations of gas composition can be used to give a smooth vertical feature (col. 3, line 65-68).

Referring to claims 6, 17, Fathimulla describes the P is about 1-5 mtorr (claim 9). Referring to claims 7, 18, Pearton further describes the dc bias is 100 V (fig. 2). Referring to claims 8, 19, with the via hole depth of 100 urn, as taught by Fathimulla, this would create a vertical feature having an aspect ratio of greater than ten (col. 2, line 36-37). Referring to claims 9-11, 20 Fathimulla describes a SiN mask (col. 2, line 30-33).

Referring to claims 3-5, 14-16, applied prior art doesn't describe the percentages of the first, second, and third gas. However, the gas percentage is a result-effective variable as discussed by Pearton, where flow rates (gas percentage) of gases are

Art Unit: 1765

experimented to achieve different etch rates (page 839; left column). Therefore, one skilled in the art would find it obvious to determine each gas percentage through routine experimentation in order to provide optimum gas flow rates or percentages to etch the substrate with a reasonable expectation of success.

(10) Response to Argument

Appellant's argument that Fathimulla teaches away of using CH₄ and H₂ because they are always recited by Fathimulla in the alternative and because Pearton teaches replaces CH₄/H₂/Ar mixture with HI/H₂/Ar mixture is found unpersuasive because these are not teaching away but they just teach a way of etching. Furthermore, teaching of replacing a mixture of CH₄/H₂/Ar with another gas mixture at certain processing parameters doesn't necessarily mean that the components of CH₄/H₂/Ar can't be used together. In fact, Pearton shows that at the time of the invention was made, CH₄/H₂ has been known and used by one skilled in the art for etching III-V materials to provide a smooth etching or surface (page 838, col. 1, first paragraph). As suggested by Pearton, the smooth surface is achieved by the addition of the H₂ (page 839, 1st column, 2nd paragraph) and Fathimulla teaches that other combinations of gas composition can be used to give a smooth vertical feature (col. 3, line 65-68). Fathimulla also shows that H₂ is compatible with HBr (col. 2, line 10-18). Therefore, using H₂ with HBr/CH₄ would be obvious to one skilled in the art at the time of the invention was made because it would provide a smooth etching or surface.

The rejection is therefore meet the requirements to establish a *prima facie* case of obviousness because the teaching or suggesting to add H₂ is found in the prior art

Art Unit: 1765

(suggested by Pearton) and the combination of H₂/HBr/CH₄ would provide a reasonable expectation of success because Fathimulla has shown that H₂ is compatible with HBr and Pearton teaches that H₂ is compatible with CH₄.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Duy-Vu Deo

8/8/07

Conferees:

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Norton, Nadine - SPE 1765

John Smith, CAS 1700

Nu